

REMARKS

Claims 1-6 and 8-34 were examined and are rejected. Applicants amend claims 1, 13, 22, 28 and 34. Applicants amend claim 1 to incorporate canceled claim 4; and amend 22 to incorporate canceled claim 24. New matter is added herein as other amendments to claims 1, 13, 22, 28 and 34 are supported at least by prior claims 2 and 4; and at paragraph 15 and Figures 7-9 of the application. Applicants submit additional claims 35-36. Additional claims 35-36 is supported at least by claim 34, and paragraph 34 and Figures 4-5 (e.g. see blocks 250 and 270) of the application as filed. Applicants respectfully request reconsideration of claims 1-3, 5-6, 8-22, and 25-34 as amended, and consideration of additional claims 35-36 in view of at least the following remarks.

I. Claims Rejected Under 35 U.S.C. § 103

The Patent Office rejects claim 1, 3, 13-16, 22, 28-30 and 32 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Publication 2002/0052990 to Chan et al. ("Chan") in view of U.S. Patent 5,894,577 to MacDonald et al. ("MacDonald"). The Patent Office rejects claim 2, 4, 6, 8-12, 17-21, 23-27, and 34 under 35 U.S.C. § 103(a) as being unpatentable over Chan in view of MacDonald and in view of U.S. Patent Publication No. 2001/0028780 to NA et al. ("NA"). Claim 31 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Chan in view of MacDonald, further in view of U.S. Patent 6,888,962 to Hsu ("Hsu"). Claim 33 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Chan in view of MacDonald, further in view of U.S. Patent Publication 2003/0206520 to Wu et al. ("Wu"). To render a claim obvious, all limitations of that claim must be taught, suggested, or obvious in view of at least one properly combined reference.

Applicants disagree with the rejection above for claim 1. Claim 1 is not taught or enabled by the references for at least the reason that Chan fails to teach or enable apportioning at least apportion of the total memory bandwidth amongst the plurality of bandwidth requests according to a power managed profile and a plurality of data rate requirements associated with the plurality of isochronous devices, wherein the power managed profile causes the bandwidth to be apportioned amongst the requests based at least on interrupt driven asynchronous activity and

isochronous data communication, wherein apportioning includes dividing the total memory bandwidth into a plurality of portions of the total memory bandwidth and satisfying at least two of the plurality of bandwidth requests each with at least one of the plurality of portions of the total memory bandwidth by combining data of at least two isochronous data packet transmissions into a combined data packet for transmission, as required by claim 1.

As noted on page 3 of the current Office Action, the Patent Office acknowledges that Chan only teaches “turning on or off of a device” which affects the portion of bandwidth required for the device. However, this clearly does not teach dividing the total memory bandwidth into a plurality of portions, as required by amended claim 1.

Next, in the first paragraph of page 10 of the current office Action, the Patent Office asserts that Chan actually implicitly teaches a combination of two isochronous data streams into one data stream in data bus 116 in FIG. 1. However, the Patent office has not identified and Applicants are unable to find any teaching or enablement in Chan of combining the data of at least two isochronous data packet transmissions into a single combined data packet, as required by amended claim 1.

In addition, by apportioning the bandwidth amongst the bandwidth request according to the power managed profile based at least on interrupt driven asynchronous activity and isochronous data communication, and according to a plurality of data rate requirements, as required by claim 1, embodiments described in the specification, without limitation thereto, provide the unexpected benefits of: (1) achieving a balance between total power available and the minimum bandwidth requirements of individual entities (see paragraph [0014] of the application); (2) achieving apportioning of the bandwidth dependent on selections and policies, such as those related to power usage by a processor, RAM memory, hard drive, processor logic, memory controller, chip set logic, and data bus use (see paragraph [0023] of the application); and (3) apportioning based on an influence of interrupt driven asynchronous activity and having a goal of minimizing power consumption (see paragraph [0024] of the application). However, none of the cited references teach or enable such unexpected benefits.

Moreover, by combining the data of at least two isochronous data packet transmissions into a single combined data packet for transmission, embodiments described in the specification,

for example, without limitation thereto provide the unexpected benefits of: (1) transmitting appended isochronous data during an opportunistic data transmission or during a time identified for transmitted a combined isochronous data transmission, but prior to a time delay compliance limit for transmitting the isochronous data (see paragraph [0014] of the application); (2) reducing the number of times data must be transmitted and reducing power consumed in order to transmit isochronous data, since the components necessary to transmit the data need to be powered up less frequently (see paragraph [0049] and FIGs. 6-9 of the application). However, none of the references teach or enable such benefits.

Instead, Chan discloses different power management routines (PMR) that may be executed to cause a computer to enter different operating modes based on the ACPI specification, which can cause a computer to reach low power states by not executing programs, turning devices on and off, and not preserving the system context during these states (see paragraphs 9-14). Moreover, the ACPI specification defines device power states such as where the device is completely active, preserves more or less context, or has power fully removed (see paragraphs 15-19). Thus, the CPU may monitor peripheral devices, such as CD-ROMs, to suspend them and resume them to operation (see paragraphs 21-22). However, in each of these instances, some portion of the computer must remain energized (see paragraph 24). The primary purpose of Chan is to provide a CD-ROM subsystem that couples a bus of a computer subsystem to a CD-ROM drive and its control buttons, such that the system permits turning the computer system off while the audio interface autonomously responds to control buttons (e.g., asynchronous inputs) of the CD-ROM drive (see Abstract; paragraphs 42-43 and 51; and figs. 2 and 6-8). It is noted that the ACPI power management routines (PMRs) formed no part of the invention of Chan (see paragraph 41). For example, Chan teaches that multiplexer 412 may be enabled to permit exchanging of signals or disabled to isolate signals to connect or disconnect IDE devices from IDE-bus extension 129 (see paragraph 76). Specifically, Chan describes that transmission gates may cause delays or power drain because communication between bus bridge IC 124 and IDE device 138 go through IC 102 (see paragraph 73).

Alternatively in Figs. 7-8, in a first operating mode the computer system of Chan is energized and operating, and the audio interface IC relays commands (e.g., asynchronous inputs) and data; in a second operating mode, the computer system is not energized, and the audio

interface IC autonomously responds to signals received from the CD-ROM control buttons (e.g., asynchronous inputs) which cause the CD-ROM drive to play the audio CD; in a third operating mode, in which the computer system is energized and operating, the IC receives commands from the CD-ROM control buttons (e.g., asynchronous inputs) and stores them for subsequent retrieval by a program executed by the computer (see paragraphs 80-85 and Figs. 7-8).

Consequently, none of these sections teach or enable apportioning a memory bandwidth amongst requests for isochronous devices according to a power manage profile and a plurality of data rate requirements for isochronous devices, wherein the power managed profile causes the bandwidth to be apportioned amongst the requests based at least on interrupt driven asynchronous activity and isochronous data communication. Instead, they describe ACPI PMRs to reach low power states based on whether or not a program is executed, whether a device is turned on or off, or whether context is preserved. Thus, claim 1 requires something more which is that a total memory bandwidth can be apportioned amongst requests from isochronous devices. In addition, claim 1 requires something more that such apportioning can be according to a power managed profile. Finally, claim 1 requires something more that the apportioning can be according to a plurality of data rate requirements associated with the isochronous devices.

Finally, Chan does not teach, enable or consider a power managed profile based at least on interlock driven asynchronous activity and isochronous data communication, where the profile causes the bandwidth to be apportioned amongst the request, as required by claim 1.

MacDonald fails to cure the deficiencies of Chan. MacDonald teaches an interrupt controller with a priority resolver to compare the priority level of interrupt lines and direct servicing of the highest priority level; and having a power management unit to advantageously stop unused clock signals and/or remove power from inactive circuit portions when an interrupt routine completes without having to estimate the time of completion, to reduce overall power consumption (see col. 1, l. 35-38; col. 2, l. 36-60). However, the interrupt requests and communications of MacDonald are asynchronous, such as those from keyboards, displays, timers, sensors, and other components that execute certain tasks independently of the central source or micro processor (see col. 1, l. 38-43; col. 4, l. 58-63 and Fig. 1 IR0-IR7). Consequently, MacDonald does not teach, enable or consider, consider, or enable a power

manage profile base at least on interlock driven asynchronous activity and isochronous data communication, where the profile causes the bandwidth to be a portion amongst the requests, as required by claim 1, or benefits thereof as noted above.

Similarly, McDonald fails to teach combining the data of at least two isochronous data packet transmissions into a combined data packet for transmission, as required by amended claim 1, or benefits thereof as noted above.

In addition, NA (cited against claim 4 which is now incorporated into claim 1) fails to cure the deficiencies of the other references for claim 1. First, the Patent Office has not identified and Applicants are unable to find any teaching in NA of any of the above noted apportioning according to a power managed profile of claim 1; or delaying limitations of other claims. Moreover, the Patent Office relies on NA to teach combining data of a first isochronous data packet transmission with data of a second data packet transmission into a combined data packet transmission. However, Applicants disagree. The cited section of NA (claim 10) describes that a first digital interface transfers a multi-program transport stream isochronous packet in an isochronous transfers a mode. However, it is not taught, enabled, or obvious that the single program transport stream includes data of a first isochronous data transmission combined with data of a second data transmission. Specifically, on pages 8-9 of the current Office Action the Patent Office states that NA teaches data of first and second isochronous data transmissions into a combined data transmission "new stream". However, the Patent Office has not identified and Applicants are unable to find any teaching in NA of combining data of at least two isochronous data packet transmissions into a combined data packet for transmission, as required by amended claim 1, or benefits thereof as noted above.

Instead, the principle of operation of NA is that the single program transport stream of the second digital interface is extracted from the multi program transport stream of the first interface based on the program number used to select one of the transport streams of the multi program transport stream (see Claim 1 of NA). Hence, NA teaches against the above noted limitations of claim 1 by having a principle of operation of extracting one of the multiple transport streams for recording and for generating the transport stream for the second digital interface during playback

mode, while claim 1 requires combining data of isochronous data transmissions into a combined data packet for transmission.

Hsu fails to cure the deficiencies of the other references with respect to claim 1. Hsu teaches maximizing the life a battery of a computer (see col. 1, l. 28-30). However, Hsu does not teach the power managed profile or the combined data packet of claim 1, or benefits thereof as noted above.

Similarly, Wu fails to cure the deficiencies or the other references with respect to claim 1. Wu teaches optimal and flexible balance between radio bandwidth, terminal storage and power usage (see paragraph 47). However, Wu fails to teach the power managed profile, or the combined data packet of claim 1, or benefits thereof as noted above.

Arguments similar to those above for claim 1 apply to independent claims 13, 22 and 28.

Applicants disagree with the rejection above for claim 2 for at least the reason that the cited references do not make obvious a data transmission policy to manage delaying transmission of a first isochronous data transmission and to manage combining data of the first isochronous data packet transmission with data of the second data packet transmission into a combined data packet transmission, as required by claim 2. The Patent Office relies on Chan to teach delaying transmission of a first isochronous data transmission. Applicants disagree. Specifically, Chan describes that transmission gates may cause delays or power drain because communication between bus bridge IC 124 and IDE device 138 go through IC 102 (see paragraph 73). However, a description of a delays or power drain due to using transmission gates of an IC does not teach or make obvious delaying transmission of an isochronous data packet transmission and combining that data packet with data of the second data packet transmission, as required by claim 2. Specifically, claim 2 requires something more in that the first isochronous transmission packet is delayed and its packet data is combined with packet data of another transmission, such as to achieve a balance between total power available and minimum bandwidth requirements of individual entities (see paragraph 14 of specification); and/or to reduce power consumed in order to transmit data (see paragraph 49 of specification). Hsu, Wu, Na, and MacDonald also fail to teach the combined data packet transmission of claim 2.

Moreover, in addition to being dependent allowable base 1, applicants disagree with the rejection above of claim 3 for at least the reason that the cited references do not teach or enable polling a plurality of isochronous application corresponding to the plurality of isochronous devices, as required by claim 3. Chan describes analog multiplexer for 12 permitting exchanging signals between thus extension 129 and either thus 128 or state machine 202 (see paragraph 76 and Figure 6). However, the patent office has not identified an applicant's any teaching or enablement in the cited references of the above-noted limitations of claim 3.

Next, Applicants disagree with the rejection above of independent claim 5 for at least the reason that the cited references do not teach or make obvious delaying transmission of a first isochronous data packet transmission, and appending the first isochronous data packet transmission with a second isochronous data packet transmission into a combined data packet transmission, according to a data transmission policy; and selecting a time to transmit the combined data packet transmission, wherein selecting includes selecting between a transmission time of an opportunistic data transmission and a transmission time of a combined isochronous data packet transmission, as required by claim 5. An argument analogous to the one above for claim 2 applies here as well. Specifically, none of the references teach, enable, or make obvious delaying a transmission of isochronous data packet and combining that transmission packet with a second isochronous data packet transmission in to a combined data packet transmission. Such claim requirements require something more of delaying and combining isochronous data packet transmissions, such as to achieve a balance between total power available and minimal bandwidth requirements of individual entities (see paragraph 14 of the specification); and/or to reduce power consumed in order to transmit data (see paragraph 49 of the specification).

Finally, the cited references do not teach selecting a time to transmit the combined data packet transmission between a transmission of an opportunistic data transmission and a transmission time of a combined isochronous data packet transmission, as required by amended claim 5. The Patent Office argues that isochronous data transmission need to be transmitted within a given period, which can be divided into a first part which is the time that the transmission needs to be transferred, and a second part that can be used for other data (page 8 of the current Office Action). This explanation appears illogical since the first part and the given period is the time within which the transmission needs to be transmitted.

In any event, the Patent Office has not identified Applicants unable to find any teaching in the references of selecting a transmission time of an opportunistic data transmission and a transmission time of a combined isochronous data packet transmission as required by amended claim 5.

In addition, by including the selection between the transmission time of an opportunistic data transmission and that of a combined isochronous data packet transmission, embodiments described in the specification of the present application (such as described at paragraph 0049 of the Application), for example, without limitation thereto, provide unexpected benefits of reducing power consumed in order to transmit data since the components necessary to transmit the data need to be powered up less frequently (1) because the transmissions are for isochronous data that is in combined packets (e.g., T₂ of Figure 8 and paragraph 0038 of the Application), and (2) the packet transmissions may be piggyback with opportunistic transmissions (see T₀₁ of Figure 9 and paragraph 0038 of the Application). However, none of the references cited describe or enable these benefits.

In addition, by including the power managed profile based at least on interrupt driven asynchronous activity and isochronous data communication, embodiments described in the specification provide the unexpected benefits of achieving a balance between total power available and minimum bandwidth requirement of individual entity, such as for asynchronous entities and isochronous entities as described at paragraphs 0015 and 0024-0026 of the Application. However, none of the references described or enable such benefits.

In addition, arguments above with respect to claim 1 apply to claim 5 as well, to disagree with the Patent Office's assertion that Chan, McDonald and NA implicitly teach any sort of combination of isochronous data streams, or of isochronous data transmissions, into a combined packet and respectfully request the Patent Office provide an example of such teachings in according with MPEP §2144.03.

Finally, the arguments above with respect to claim 1 and NA apply to claim 5 as well, to show NA failing to cure deficiencies of the other references, because NA teaches against, does not enable, and does not make obvious the above noted limitations of claim 5. Instead, the

principle of operation of NA is that a single transport stream is extracted from a multi program transport stream, as opposed to combining data of the two streams, as required by claim 5.

In addition to being dependent upon allowable base claim 5, Applicants disagree with the rejection above of claim 8 for at least the reason that the cited references do not make obvious selecting a time to transmit the combined data packet transmission as a transmission time of one of an asynchronous data packet transmission and a third isochronous data packet transmission as required by claim 8. An argument above with respect to claim 5 applies here as well.

Specifically, Applicants traverse that such a limitation would be obvious to a person of ordinary skill and request the Patent Office provide a reference in support of that position in accordance with MPEP § 2144.03. Specifically, nothing in the references teaches, enables, or makes obvious a combined data packet transmission, or selecting a time to transmit a combined data packet transmission by selecting an asynchronous data packet transmission or a third isochronous data packet transmission, as required by claim 8, since an isochronous data packet transmission can be transmitted during any time of the required period. Also, as noted above, using Official Notice to support such a position is impermissible hindsight if it is derived only from Applicants' claims.

In addition to being dependent upon allowable base claim 5, Applicants disagree with the rejection above of claim 9 for at least the reason that the cited references do not teach or make obvious reducing a first frequency of transmission times related to transmitting the first isochronous data packet transmission to a less frequent second frequency of transmission times related to transmitting the combined data packet transmission, as required by claim 9. An argument analogous to the one above for claim 5 applies here as well. That is, the combined references do not teach, enable, or make obvious a combined data packet transmission, or reducing a frequency of transmission times, or, a less frequent second frequency of transmission times, as required by claim 9. Applicants traverse that any of such limitations would be obvious to a practitioner in the art, and request the Patent Office provide a reference in support of such position in accordance with MPEP §2144.03. Moreover, Applicants assert that saying such limitations would be obvious to a person of ordinary skill is impermissible hindsight as it gleaned only from the claims, since there is no teaching in any of the references of a combined

data transmission, or reducing a frequency of data packet transmissions by combining data of transmissions.

In addition to being dependent upon allowable base claim 5, Applicants disagree with the rejection of claim 11, for at least the reasons that the cited references do not teach or make obvious delaying transmission of a second isochronous data packet transmission. An argument analogous to the one above for claim 5 applies here as well. Hence, Applicants traverse that such a limitation would be obvious in accordance with MPEP §2144.03 and submit that saying that such a limitation is obvious is impermissible hindsight.

Applicants disagree with the rejection above of claim 17 for at least the reasons given above with respect to the corresponding limitations of claim 5. Hence, an argument analogous to the one above for claim 5 applies here as well.

Applicants disagree with the rejection above for claims 18, 23, 25, 26, and 27 for at least the reasons given above in support of corresponding claims 8, 2, 5, 6 and 7. Thus, arguments analogous to those of claims 8, 2, 5, 6, and 7 apply to the corresponding limitations of claims 18, 23, 25, 26 and 27, respectively.

Applicants disagree with the rejection above of claim 28 and assert that claim 28 is allowable for at least the reasons given in support of claims 1 and 2 combined.

In addition to being based on allowable base claim 28, Applicants disagree with the rejection above of claim 29 for at least the reason that the Applicants traverse that it would be obvious to a practitioner to identify a plurality of transmission time periods during which to transmit a plurality of combined isochronous data transmissions and select a time to transmit the combined data transmission between one of a transmission time of an asynchronous data transmission, a third isochronous data transmission, and a transmission time of one of a plurality of combined isochronous data transmissions as required by claim 29 in accordance with MPEP §2144.03. An argument analogous to the one above for claim 5 applies here as well. Moreover, as noted for claim 5, Applicants assert that saying such limitations are obvious to a person of skill because isochronous data needs to be transmitted (see current Office Action, page 12, lines

7-8) is impermissible hindsight and request that the Patent Office provide a reference to support such Official Notice, in accordance with MPEP §2144.03.

In addition to being based on allowable claim 28, Applicants disagree with the rejection above of claim 30 for at least the reason that the cited references do not teach or make obvious wherein the transmit policy transmits an opportunistic data transmission prior to expiration of a transmission time period, and having media data from at least two isochronous data transmissions, as required by claim 20. An argument analogous to the one above with respect to claims 7 and 29 applies here as well. That is, Applicants traverse Official Notice of such limitations and request the Patent Office provide a reference to support of such a position in accordance with MPEP §2144.03. Furthermore, such Official Notice is impermissible hindsight as it is gleaned only from Applicants' claim.

In addition to being based on allowable claim 1, Applicants disagree with the rejection of dependent claim 34 for at least the reason that none of the cited references teach combining data of a third and fourth isochronous data packet transmission with an asynchronous data packet transmission into the combined data packet transmission, as required by amended claim 34. Although Chan includes a keyboard and a mouse bus system 116, the Patent Office has not identified and Applicants unable to find any teaching or enablement in the cited references of the above noted limitations of dependent claim 4.

In addition, by combining data of the third and fourth isochronous data packet transmissions with data of an asynchronous data packet transmission into the combined data packet transmission, embodiments described in the specification, for example, without limitation thereto provide the benefits of: (1) transmitting together data from isochronous data transmissions and asynchronous data transmissions into a combined data transmission that can be transmitted during an opportunistic transmission or during a time identified for transmitting a combined isochronous data transmission, but prior to a time delay compliance for the isochronous data (see paragraph [0014] of the application); and (2) reducing the number of times data must be transmitted and power consumed in order to transmit data since components necessary to transmit isochronous and asynchronous data need to be powered up less frequently

to transmit the combined data packets (see paragraph [0049] of the application). Consequently, none of the cited references teach or enable such benefits.

Any dependent claims not mentioned above or submitted is being patentable for the reasons provided above in support of their base claim as well as additional limitations of those dependent claims.

Hence, applicants respectfully request all of the rejections above to be withdrawn.

II. Additional Claims 35-36

Applicants submit that additional claims 35-36 are allowable for at least the reasons provided above and support of its base claim, as well as additional limitations of the dependent claim.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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Dated:

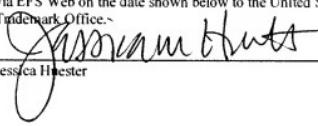
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